

Opportunita' di Tesi di Laurea Magistrale

All'interno della collaborazione internazionale tra il **Laboratorio "R. Boscaino" of **Advanced Materials** del DiFC ed il **Laboratorio Hubert Curien** dell'Università Jean Monnet di Saint Etienne (Francia) sono disponibili i seguenti argomenti di tesi per Laurea Magistrale in Fisica:**

1) Caratterizzazione di sensori basati su fibre ottiche per impieghi in ambiente radiattivo. Parte del lavoro verra' svolta presso il Comitato per l'Energia Atomica (CEA)

2) Caratterizzazione di giroscopi basati su fibre ottiche (in collaborazione con la azienda iXBLue)

Gli interessati possono prendere contatti con i Prof. M. Cannas, S. Agnello

9 Novembre 2018

ixblue is world-renowned for the design and manufacture of high-tech equipment for navigation, positioning and underwater imaging, as well as shipbuilding and photonics. Based on its unique technologies developed in-house, ixblue offers its civilian and military customer's turnkey solutions that enable them to carry out their maritime, terrestrial and space operations with the greatest efficiency. The group employs more than 600 people worldwide and operates in more than 35 countries.

Fiber optic gyroscopes: sound and light internship !

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Name and position of the Training Supervisor: Sylvain GIRARD, Professor

Location: UMR CNRS 5516, Hubert Curien Lab., University of St Etienne (42)



The missions:

You will work yourself on the gyro sensors of the inertial navigation systems.

Fiber optic gyroscopes are Sagnac interferometers that measure rotational speeds as low as a milli-degree per hour. Performances of the sensors are now limited by deformation and stresses within the coil due to exposure to extreme temperatures (-40/80°C). However, these phenomena can be optically characterized, thanks to the analysis of the Brillouin and Rayleigh scattering.

The internship will take place in the Hubert Curien laboratory, as part of the LabH6 joint laboratory, under the supervision of a researcher from the laboratory and in collaboration with ixblue's R&D engineers (Lannion for optical fibre and St-Germain for the gyroscope sensor). LabH6 is a joint laboratory created in 2018 between Hubert Curien and ixblue that aims mainly to characterize the radiation vulnerability of different types of materials and optical fibers and in particular those based on pure or doped silica, to understand and identify the mechanisms responsible for the degradation of components and systems using optical fibers in harsh environments and finally to develop and validate simulation tools at the component level to predict their response and that of systems using them in a given environment.

The intern will:

- First, get an understanding of the physical phenomena involved in the different measurements
- Then participate in the preliminary definition of the experimental protocol and perform the Brillouin and Rayleigh measurement campaigns (on so-called BOTDA, BOTDR, OBR devices)
- Compare the results according to the Brillouin and Rayleigh measurements
- Recommend the most appropriate types of measurement and analysis

Profile: Student in the last year of engineering school or in Master2. European nationality is mandatory. The internship may eventually continue with a PhD thesis.

Skills:

- You are a student in an engineering school or Master's degree, with a solid background in optics and are looking for a Master thesis. You have a taste for experimental work and team spirit.
- You have good writing skills, a good ability to synthesize, are rigorous and autonomous.
- Knowledge of Optical Fiber/Interferometry is required. The mastery of Python or Labview and Matlab would be a plus.

Start date: 6 months, starting January 2019 (depending on school/training) flexible

Remuneration: 1500€/month. Some travels in the Paris region to be planned.

Please send your applications to: sylvain.girard@univ-st-etienne.fr and emmanuelle.peter@ixblue.com

Tags: Gyroscope, optical fiber, Brillouin diffusion, Rayleigh diffusion, BOTDA, BOTDR...

